

## WHAT IS CLAIMED IS:

1. A performance management method provided for a computer system having a computer for executing a program and a storage apparatus for storing data used in execution of said program,  
5       said performance management method comprising:
  - a procedure (1) for acquiring information on a performance required for said program;
  - a procedure (2) for acquiring mapping information of said  
10      data used in execution of said program from said computer and said storage apparatus;
  - a procedure (3) for acquiring utilization statistic information from said storage apparatus;
  - a procedure (10) for creating a plan to change settings  
15      of said storage apparatus by using said information acquired by said procedures (1) to (3); and
  - a procedure (11) for issuing a request for a setting change according to said plan to change settings to said storage apparatus.
- 20       2. A performance management method provided for a computer system in accordance with claim 1, said performance management method further comprising a procedure (4) for acquiring information on a priority level of said program;
  - wherein said information acquired by said procedure (4)  
25      is also used in said procedure (10) to create said plan to change

settings of said storage apparatus.

3. A performance management method provided for a computer system in accordance with claim 1 wherein:

5        said procedure (1) includes a process for acquiring a processing execution time required for said program, a method for estimating a processing execution time and the amount of data supplied to said program as an input; and

10      said procedure (10) uses said processing execution time required for said program, said method for estimating a processing execution time and said amount of data input to said program in creating said plan to change settings of said storage apparatus.

15      4. A performance management method provided for a computer system in accordance with claim 3 whereby said utilization statistic information acquired by said procedure (3) is used in acquiring said method for estimating a processing execution time.

5. A performance management method provided for a computer system in accordance with claim 1 wherein:

20      said procedure (1) includes a process for acquiring information on a processing response time required for said program and information on an actually measured value of said processing response time on said program; and

25      said procedure (10) uses said information on a processing response time required for said program and said information

on an actually measured value of said processing response time on said program in creating said plan to change settings of said storage apparatus.

6. A performance management method provided for a computer  
5 system in accordance with claim 1 wherein:

    said storage apparatus has a port for connecting said storage apparatus to an external apparatus and has a priority-access control function for limiting an amount of processing making accesses through said port; and

10       said plan created in said procedure (10) to change settings of said storage apparatus is a plan to change a set value of said priority-access control function.

7. A performance management method provided for a computer system in accordance with claim 1 wherein:

15       said storage apparatus has a data cache segmented into several cache areas and managed by using said cache areas and has a function of dynamically allocating said cache area onto said segmented data cache, removing said cache area from said segmented data cache and changing the size of said cache area  
20 of said segmented data cache; and

    said plan created in said procedure (10) to change settings of said storage apparatus is a plan to allocate said cache area onto said segmented data cache, remove said cache area from said segmented data cache and change the size of said cache area of  
25 said segmented data cache.

8. A performance management method provided for a computer system in accordance with claim 1 wherein:

5       said storage apparatus has at least two physical storage means, a function of presenting a logical storage area using a storage area of said physical storage means and a physical storage location modification function of dynamically changing a relation associating said logical storage area with said storage area of said physical storage means; and

10      said plan created in said procedure (10) to change settings of said storage apparatus is a plan to issue a command for changing said relation associating said logical storage area with said storage area of said physical storage means by execution of said physical storage location modification function.

15      9. A performance management method provided for a computer system having a first computer for operating a database management system, a second computer for executing a program issuing a request for a process to said database management system and a storage apparatus for storing data handled by said database management system, said performance management method  
20      comprising:

      a procedure (21) for acquiring information on performance required for said program;

25      a procedure (22) for acquiring information on data in a database used in a process specified in said request issued by said program to said database management system;

a procedure (23) for acquiring mapping information of data used for executing said program from said first computer and said storage apparatus;

5 a procedure (24) for acquiring utilization statistic information from said storage apparatus;

a procedure (30) for creating a plan to change settings of said storage apparatus by using said information acquired by said procedures (21) to (24); and

10 a procedure (31) for issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

10. A performance management method provided for a computer system in accordance with claim 9 wherein said first and second computers are one and the same computer.

15 11. A performance management method provided for a computer system in accordance with claim 9 wherein:

said storage apparatus has a port for connecting said storage apparatus to an external apparatus and has a priority-access control function for limiting an amount of 20 processing making accesses through said port; and

said plan created in said procedure (30) to change settings of said storage apparatus is a plan to change a set value of said priority-access control function.

25 12. A performance management method provided for a computer system in accordance with claim 9 wherein:

5        said storage apparatus has a data cache segmented into several cache areas and managed by using said cache areas and has a function of dynamically allocating said cache area to said segmented data cache, removing said cache area from said segmented data cache and changing the size of said cache area of said segmented data cache; and

10        said plan created in said procedure (30) to change settings of said storage apparatus is a plan to allocate said cache area to said segmented data cache, remove said cache area from said segmented data cache and change the size of said cache area of said segmented data cache.

13. A performance management method provided for a computer system in accordance with claim 9 wherein:

15        said storage apparatus has at least two physical storage means, a function of presenting a logical storage area using a storage area of said physical storage means and a physical storage location modification function of dynamically changing a relation associating said logical storage area with said storage area of said physical storage means; and

20        said plan created in said procedure (30) to change settings of said storage apparatus is a plan to issue a command for changing said relation associating said logical storage area with said storage area of said physical storage means by execution of said physical storage location modification function.

25        14. A computer system for managing performance of a storage

apparatus, said computer system comprising:

    a first computer for operating a database management system;

5     a second computer for executing a program issuing a request for a process to said database management system;

    said storage apparatus for storing data handled by said database management system; and

    a management apparatus;

    wherein said management apparatus is used for:

10     acquiring

        information on performance required for said program;

        information on data in a database data used in a process specified in said request issued by said program to said database management system;

15     mapping information of said data used in execution of said program from said first computer and said storage apparatus; and

        utilization statistic information from said storage apparatus;

20     creating a plan to change settings of said storage apparatus by using said acquired information; and

        issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

25     15. A computer system for managing performance of a storage

apparatus in accordance with claim 14 wherein said first and second computers are one and the same computer.

16. A computer system for managing performance of a storage apparatus in accordance with claim 14, said computer system 5 further comprising a storage control apparatus connected between said first computer and said storage apparatus and used for controlling data transfers between said first computer and said storage apparatus.

17. A computer system for managing performance of a storage 10 apparatus in accordance with claim 14 wherein said first or second computer implements a function of collecting said information of said management apparatus, creating said plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings 15 of said storage apparatus to said storage apparatus.

18. A computer system for managing performance of a storage apparatus in accordance with claim 14 wherein said storage apparatus implements a function of collecting said information of said storage apparatus, creating said plan to change settings 20 of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

19. A computer system for managing performance of a storage apparatus in accordance with claim 16 wherein said storage control 25 apparatus implements a function of collecting said information

of said storage apparatus, creating said plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

5       20. A management apparatus for managing performance of a computer system having a first computer for operating a database management system, a second computer for executing a program issuing a request for a process to said database management system and a storage apparatus for storing data handled by said database  
10 management system,

      wherein said management apparatus is used for:  
      acquiring

      information on performance required for said program;  
      information on data in a database used in a process  
15 specified in said request issued by said program to said database management system;

      mapping information of said data used in execution of said program from said first computer and said storage apparatus;  
      and

20       utilization statistic information from said storage apparatus,

      creating a plan to change settings of said storage apparatus by using said acquired information; and  
      issuing a command for changing settings in accordance  
25 with said plan to change settings of said storage apparatus to

said storage apparatus.

21. A management apparatus for managing performance of a computer system in accordance with claim 20 wherein said first and second computers are one and the same computer.

5 22. A management apparatus for managing performance of a computer system in accordance with claim 20 wherein:

10 said storage apparatus has a port for connecting said storage apparatus to an external apparatus and has a priority-access control function of limiting an amount of processing making accesses through said port; and

said plan created by said management apparatus to change settings of said storage apparatus is a plan to change a set value of said priority-access control function.

15 23. A management apparatus for managing performance of a computer system in accordance with claim 20 wherein:

20 said storage apparatus has a data cache segmented into several cache areas and managed by using said cache areas and has a function of dynamically allocating said cache area to said segmented data cache, removing said cache area from said segmented data cache and changing the size of said cache area of said segmented data cache; and

25 said plan created by said management apparatus to change settings of said storage apparatus is a plan to allocate said cache area to said segmented data cache, remove said cache area from said segmented data cache and change the size of said cache

area of said segmented data cache.

24. A management apparatus for managing performance of a computer system in accordance with claim 20 wherein:

5       said storage apparatus has at least two physical storage means, a function of presenting a logical storage area using a storage area of said physical storage means and a physical storage location modification function of dynamically changing a relation associating said logical storage area with said storage area of said physical storage means; and

10       said plan created by said management apparatus to change settings of said storage apparatus is a plan to issue a command for changing said relation associating said logical storage area with said storage area of said physical storage means by execution of said physical storage location modification function.

15       25. A performance management program provided for a computer system having a computer for executing a software program and a storage apparatus for storing data used in execution of said software program, said performance management program implementing a function for collecting information from said 20 computer system, using said collected information to create a plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus by executions of:

25       a function for acquiring information on a performance

required for said software program;  
a function for acquiring mapping information of said data used  
in execution of said software program from said first computer  
and said storage apparatus; and

5 a function for acquiring utilization statistic  
information from said storage apparatus.

26. A performance management program provided for a  
computer system in accordance with claim 25, said performance  
management program further having a function for collecting  
10 information on a priority level of said software program;

wherein said computer system collects information on a  
priority level of said software program and uses said collected  
information to set a plan to change settings of said storage  
apparatus.

15 27. A performance management program provided for a  
computer system in accordance with claim 25 wherein:

said function of acquiring information on performance  
required for said software program is executed to acquire a  
processing execution time required for said software program,  
20 a method for estimating a processing execution time and an amount  
of data supplied to said software program as an input; and

said processing execution time required for said software  
program, said method for estimating a processing execution time  
and said amount of data supplied to said software program as  
25 an input are used in creating said plan to change settings of

said storage apparatus.

28. A performance management program provided for a computer system in accordance with claim 27 wherein said utilization statistic information acquired by one of said 5 functions are used in creating said plan to change settings of said storage apparatus.

29. A performance management program provided for a computer system in accordance with claim 25 whereby:

    said function of acquiring information on a performance 10 required for said software program is executed to acquire information on a processing response time required for said software program and information on an actually measured value of said processing response time in said software program; and  
    said information on a processing response time required 15 for said software program and said information on an actually measured value of said processing response time in said software program are used in creating said plan to change settings of said storage apparatus.

30. A computer-readable recording medium for recording 20 said performance management program provided for a computer system in accordance with claim 25.

31. A performance management program provided for a computer system having a first computer for operating a database management system, a second computer for executing a software 25 program issuing a request for a process to said database

management system, a storage apparatus for storing data handled by said database management system and a storage control apparatus connected between said first computer and said storage apparatus and used for controlling data transfers between said first 5 computer and said storage apparatus, said performance management program implementing a function for collecting information from said computer system, using said collected information to create a plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan 10 to change settings of said storage apparatus to said storage apparatus by executions of:

    a function for acquiring information on performance required for said software program;

    a function for acquiring information on data of a database 15 used in a process specified in said request issued by said software program to said database management system;

    a function for acquiring mapping information of said data used in execution of said software program from said first computer and said storage apparatus; and

20       a function for acquiring utilization statistic information from said storage apparatus.

    32. A performance management program provided for a computer system in accordance with claim 31 wherein said first and second computers are one and the same computer.

25       33. A performance management program provided for a

computer system in accordance with claim 31 wherein said first or second computer implements a function of collecting said information, creating said plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

34. A performance management program provided for a computer system in accordance with claim 31 wherein said storage apparatus implements a function of collecting said information, creating said plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

35. A performance management program provided for a computer system in accordance with claim 31 wherein said storage control apparatus implements a function of collecting said information, creating said plan to change settings of said storage apparatus and issuing a command for changing settings in accordance with said plan to change settings of said storage apparatus to said storage apparatus.

36. A computer-readable recording medium for recording said performance management program provided for a computer system in accordance with claim 31.